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FINAL REPORT

Assessment of Geology, Energy, and Minerals (GEM) Resources

ANTELOPE POCKET GEM RESOURCE AREA

(ID-010-06)

TWIN FALLS COUNTY, IDAHO

Prepared for

United States Department of the Interior
United States Bureau of Land Management
Scientific Systems Development Branch

March 1983

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Assessment of Geology, Energy, and Minerals (GEM) Resources

Antelope Pocket GRA
(ID - 010 - 06)
Twin Falls County Idaho

Prepared For:

United States Department of the Interior
United States Bureau of Land Management
Scientific Systems Development Branch

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BLM Contract No.: YA - 553 - CT2 - 1042

March 1983

This report was prepared as part of a Phase I Assessment of GEM Resources within designated Wilderness Study Areas in Oregon, Idaho and Nevada.

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DISCLAIMER

This document is part of a report prepared under Contract Number YA - 553 - CT2 - 1042 for the United States Department of the Interior, Bureau of Land Management. Although officials of the Bureau of Land Management have provided guidance and assistance in all stages of the project, the contents and conclusions contained herein do not necessarily represent the opinions or policies of the Bureau.

ACKNOWLEDGEMENTS

The authors very much appreciate the information, interpretations, and comments made by many different people and organizations as part of the preparation of this report. Special recognition goes to Mr. Jean Juilland of the Bureau of Land Management's Scientific Systems Development Branch. As Project Manager, he has provided valuable guidance and insight in all phases of the project. Mr. Durga Rimal, BLM State Geologist for Oregon and the Contracting Officer's Authorized Representative (COAR), was very helpful in the successful completion of this project. His assistance and guidance is greatly appreciated. Mr. Larry Steward, BLM State Geologist for Nevada, and Mr. Ted Holland, BLM State Geologist for Idaho, served as Project Inspectors. Their assistance in procuring needed maps, aerial photographs, and helicopter transportation also is greatly appreciated.

All members of the panel of experts provided valuable input into these assessments of GEM resources for each of the GEM Resource Areas (GRAs). Their professional approach to the problems and their interpretations of available literature and data form the foundation upon which the assessments for this project are based. We are grateful for their efforts and skills in this project. The panelists and their area of expertise are:

- Dr. Antonius Budding - Oil Shale and Tar Sands
- Mr. Raymond Corcoran - Field Verification
- Dr. James Firby - Paleontology
- Mr. Ralph Mason - Coal
- Mr. Richard Miller - Uranium and Thorium
- Mr. Vernon Newton - Oil and Gas
- Mr. Herbert Schlicker - Industrial Minerals and Geologic Hazards
- Dr. Walter Youngquist - Geothermal
- Dr. Paul Weis - Metals and Non - Metals.

Mr. Edwin Montgomery provided valuable insight and assistance in structuring the project and these reports in order to best serve the purposes of the Bureau of Land Management. We greatly apppreciate his assistance.

Technical assistance was provided by Mr. Frederic W. Lambie, Dr. Steve N. Yee and Dr. Terence L. Lammers of TERRADATA. Their assistance is most gratefully acknowledged.

Mr. Tom Mitchell assisted in the stream sediment sampling program. Bondar - Clegg provided the geochemical analysis of stream sediment samples.

Ms. Pamela Ruhl provided clerical and editorial assistance throughout the project. Ms. Sara Mathews assisted with occurrence information and drafting. Mr. Philip R. Jones and Mr. Michael A. Becker produced all documents relating to the project using TERRADATA's word processing and document production systems.

EXECUTIVE SUMMARY

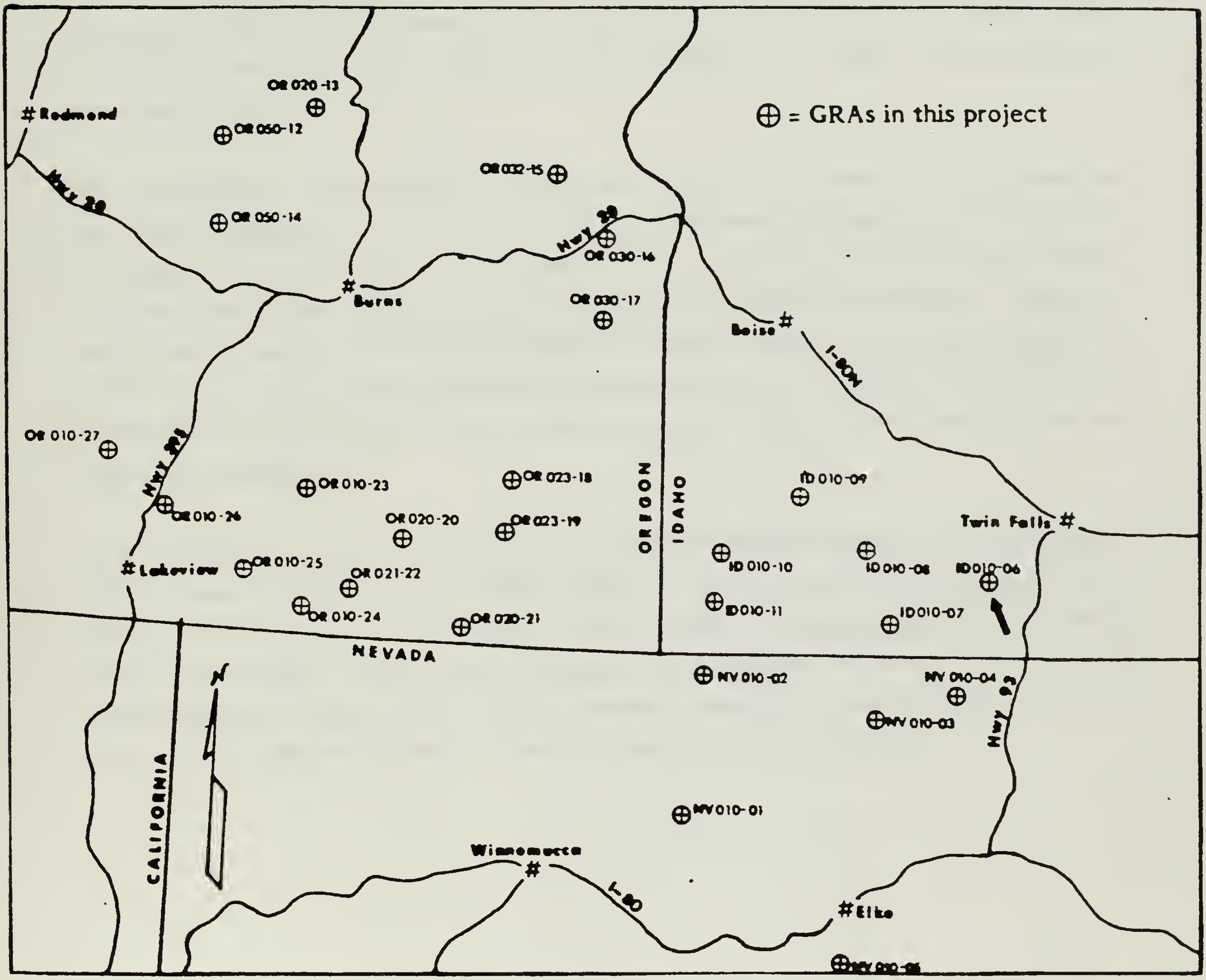
The purpose of this project is to evaluate and classify environments favorable for the occurrence of geology, energy, and minerals (GEM) resources in selected wilderness study areas (WSAs) in southeastern Oregon, southwestern Idaho, and northern Nevada. **(See TERRADATA report entitled "Procedures for the Assessment of Geology, Energy, and Minerals (GEM) Resources.")** GEM resource environments have been rated on a scale that ranges from one to four, with one being least favorable and four being most favorable. Favorability classes two and three represent low and moderate favorability, respectively. Confidence levels range from A to D with A being low confidence and D being high confidence. The confidence levels are directly related to the quantity and quality of the information available for the determination of the favorability classes.

The specific area with which this report deals is the Antelope Pocket GRA (GRA number ID - 010 - 06) which is located in southern Idaho (see attached location map). The GRA contains about 324 square miles within Townships 11S through 14S and Ranges 13E through 15E. It contains one WSA (17-10) that has an area of 3,500 acres. The study area is in the Jarbidge Resource Area of the Boise BLM District.

The GRA is within the Owyhee Upland sub-province and the Snake River Plains section of the Columbia Intermontane physiographic province. Rocks exposed in the GRA are all Tertiary or younger volcanic and volcaniclastic strata. Limited exposures of Miocene lacustrine units may occur within the GRA. The area contains no major structural features apparent on the surface. The area may be located near the Devonian Antler orogenic belt. Basin and Range block faulting is not apparent in the area because of the thick mantle of Tertiary volcanics. The Antelope Pocket GRA is not near any known mineral belts or mining districts. Historically, the area has had no significant production of any GEM resources.

The geologic environments and inferred geologic processes indicate low favorability for the accumulation of GEM resources in the Antelope Pocket GRA. The nature of the data available and the geometry of potential geologic environments do not permit subdivision of the GRA into commodity specific areas of favorability.

GRA Location Map

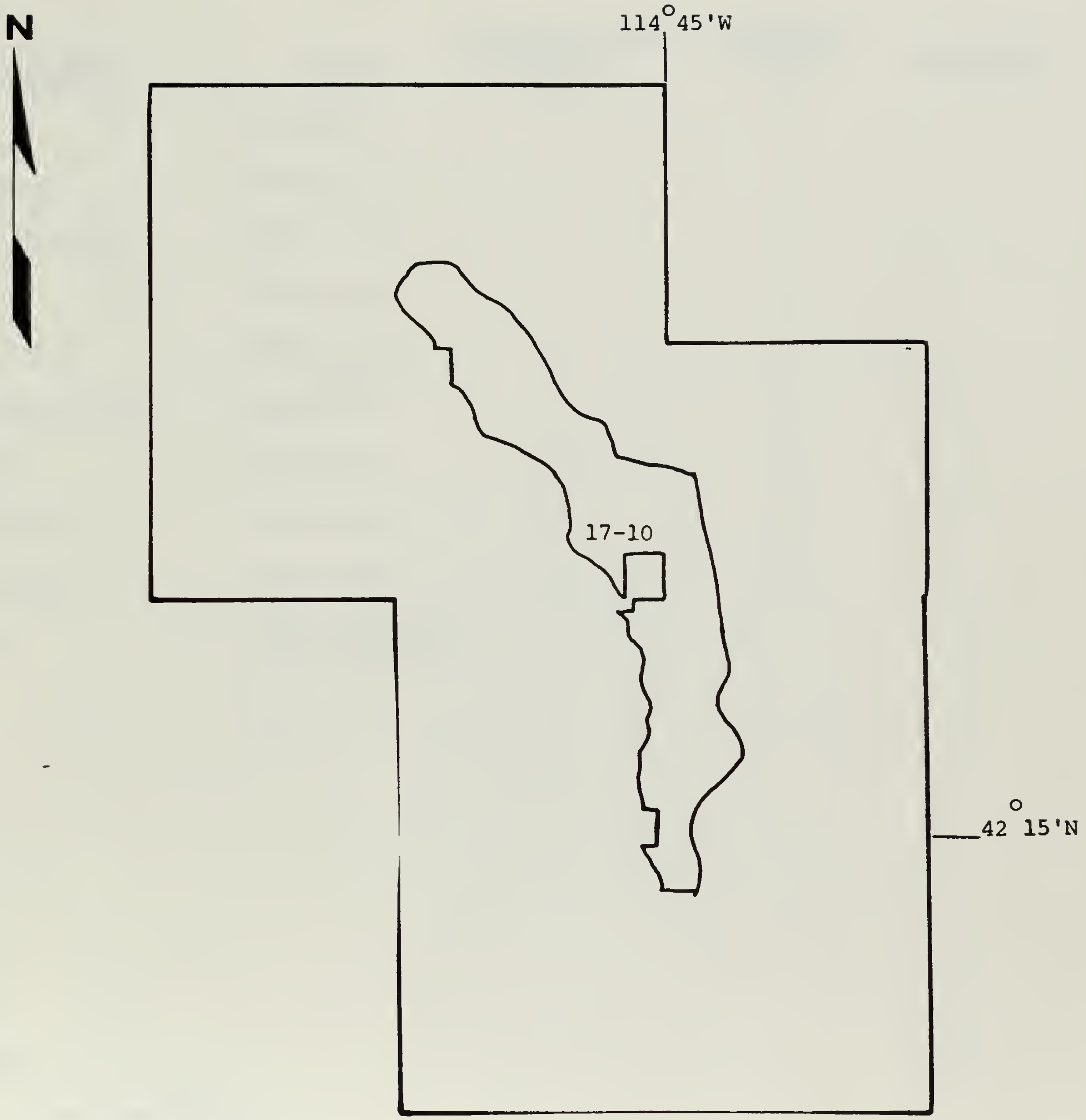


The Antelope Pocket GRA contains one geologic environment that has a low favorability for the occurrence of diatomite resources. The entire GRA is classified 2B for potential diatomite resources in accordance with the BLM classification scheme (see attached land classification map); the geologic environment, the inferred geologic processes, and known occurrences indicate low favorability for the occurrence of this resource. Deposits from which there has been minor production occur elsewhere in Tertiary volcanic units in southwestern Idaho.

The area exhibits no favorable characteristics (Class 1) for all remaining GEM resources (see GEM Classification and Confidence Level Table below). Evaluation of environments for metals, coal, geothermal, uranium and thorium, oil and gas, oil shale and tar sands, limestone, and paleontological resources have varying degrees of confidence. In general, environments essential for the accumulation of these resources do not exist within the study area. All of the least favorable classifications have low confidence levels (A or B) signifying that insufficient or only minimal indirect evidence was available for the respective evaluations.

Further surface geologic investigations, including detailed mapping and stratigraphic studies, could enhance the confidence levels of many of the classifications in the Antelope Pocket GRA. It is doubtful, however, that the original classifications would change substantially. Sub-surface investigations are probably not warranted in this area due to the costly nature of the available methods. Geophysical and geochemical surveys might provide some insight into the potential resources in the study area.

Land Classification Map
Antelope Pocket GRA
(ID - 010 - 06)
Twin Falls County, Idaho



Scale 1:250,000
(Twin Falls 1°x2° NTMS Quadrangle)

Classification Of Lands Within The
Antelope Pocket GRA
(ID - 010 - 06)
Twin Falls County, Idaho
For GEM Resource Potential

COMMODITY	AREA	CLASSIFICATION LEVEL	CONFIDENCE LEVEL	REMARKS
Metals	Entire GRA	1	B	
Geothermal	Entire GRA	1	B	
Uranium/Thorium	Entire GRA	1	A	
Coal	Entire GRA	1	C	
Oil and Gas	Entire GRA	1	B	
Tar Sands/Oil Shale	Entire GRA	1	C	
Diatomite	Entire GRA	2	B	
Other Minerals	Entire GRA	1	A	
Paleontology	Entire GRA	1	A	
Hazards	See Hazards Map (GRA File)			
ESLs	None	1	C	

LEGEND:
Class 1 - Least Favorable
Class 2 - Low Favorability
Class 3 - Moderate Favorability
Class 4 - High Favorability

Confidence Level A - Insufficient data or no direct evidence
Confidence Level B - Indirect evidence available
Confidence Level C - Direct evidence but quantitatively minimal
Confidence Level D - Abundant direct and indirect evidence

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1. INTRODUCTION

This report is one of 27 GRA technical reports that summarize the results of a Phase 1 assessment of the geology, energy, and minerals (GEM) resources in selected portions of southeastern Oregon, southwestern Idaho, and northern Nevada. The study region was subdivided into 27 GEM resource areas (GRAs), principally for ease of data management and interpretation. The assessment of GEM resources for this project consisted of an interpretation of existing literature and information by experts knowledgeable in both the geographic area and specific commodities. It is possible that the assessment would be different if detailed field exploration, geochemical sampling, and exploratory drilling programs were undertaken. (See the TERRADATA report entitled "Procedures for the Assessment of Geology, Energy, and Minerals (GEM) Resources.")

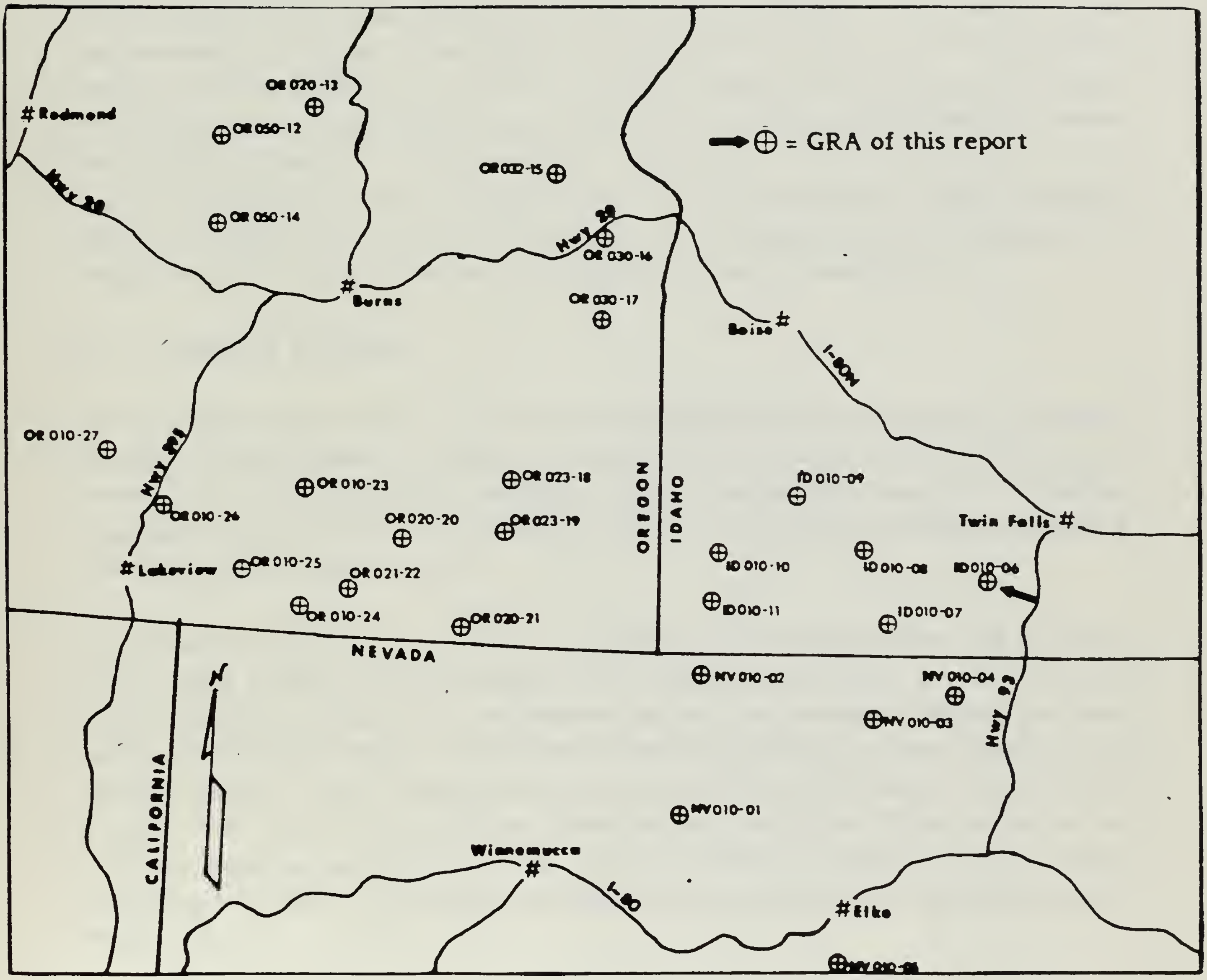
This report summarizes the assessment of the GEM resources potential of the Antelope Pocket GRA (ID-010-06). See Figure 1-1. Commodity categories for which this GRA was evaluated are:

- Metals
- Oil and Gas
- Oil Shale and Tar Sands
- Geothermal
- Uranium and Thorium
- Coal
- Industrial Minerals
- Paleontological Resources
- Geologic Hazards
- Educational and Scientific Localities (ESLs)

Geologic environments within the Antelope Pocket GRA have been rated with respect to their favorability for the occurrence of these different commodities. The favorability rating scale ranges from one to four, with one being least favorable and four being most favorable. Confidence levels in these ratings also have been assigned. These confidence levels range from A to D, with A being low confidence and D high confidence. Assigned confidence levels are related to the quantity and quality of the information available for the determination of the favorability ratings.

FIGURE 1-1

GRA Location Map



2. DESCRIPTION OF THE ANTELOPE POCKET GRA

2.1 LOCATION

The Antelope Pocket GRA (ID-010-06) is in southwest Idaho. It lies between latitudes 42°10'N and 42°31'N and longitudes 114°38'W and 115°00'W. The GRA contains approximately 324 square miles within Townships 11S through 14S and Ranges 13E through 15E (see Figures 1-1 and 2-1). The area contains one Wilderness Study Area, WSA 17-10 (3,500 acres). The Antelope Pocket GRA is in the Jarbidge Resource Area of the Boise BLM District. The area is about 10 miles from Twin Falls, Idaho, which is the nearest transportation center offering a minimum of rail, highway, and/or charter-air services. Access to the contained WSAs is via county maintained dirt or packed-gravel roads. Vehicular access to the interior of the WSAs is poor to non-existent.

2.2 GENERAL GEOLOGY

The Antelope Pocket GRA is in the Twin Falls 1°x2° NTMS quadrangle map in southwest Idaho. The data available for this area includes NURE investigations(1, 2, 3, 4)*, general mineral resource information(5), and limited small scale geologic mapping(6). Detailed mapping is not available for areas within the GRA. The available information regarding commodities in the region is poor.

The Antelope Pocket GRA is between the Owyhee Upland sub-province and the Snake River Plains section of the Columbia Intermontane physiographic province(7). The Owyhee Upland is a plateau and mountainous region in northern-most Nevada, southwest Idaho, and southeast Oregon. The Owyhee Upland sub-province is separated from the Great Basin by a major drainage divide located south of the Antelope Pocket GRA in Nevada. The area is bounded on the north by the Snake River Plains section of the Columbia Intermontane province. The Idavada volcanics comprise the oldest rocks exposed in the GRA. The youngest and most abundant rocks are Tertiary olivine basalts (Figure 2-2).

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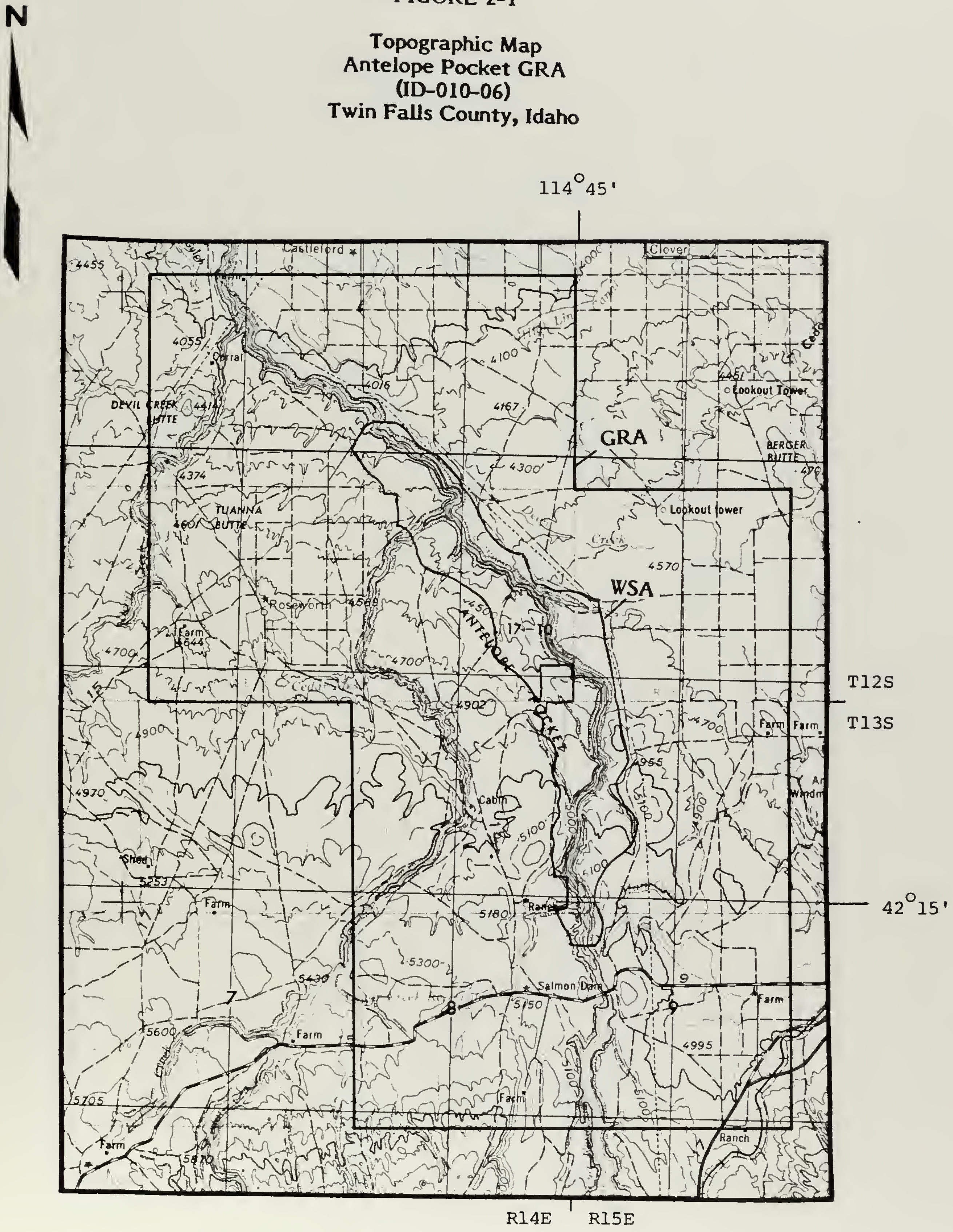
* In this report, citations are superscripted numbers. They refer to bibliographic entries listed in Appendix A, References Cited.

FIGURE 2-1

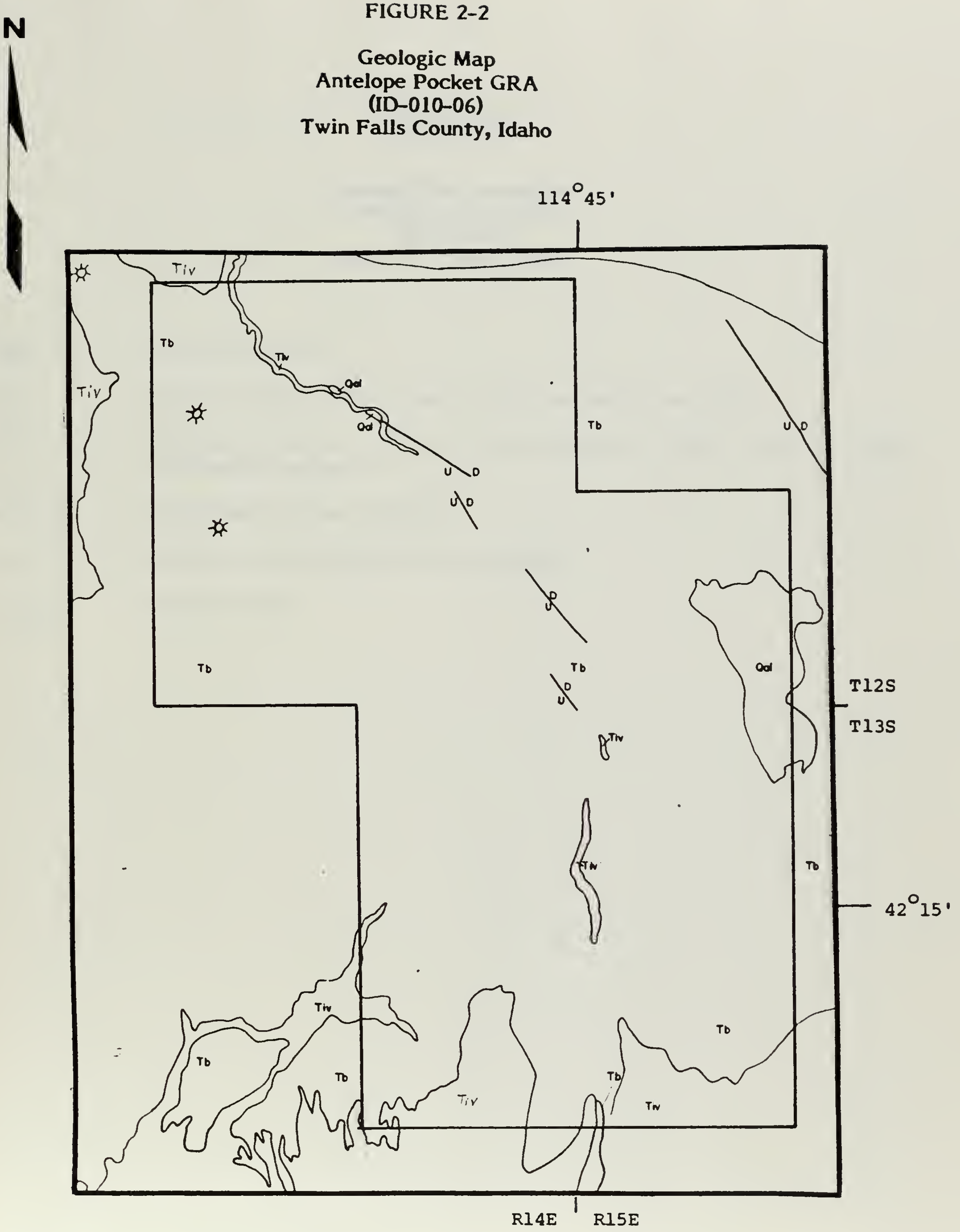
Topographic Map
Antelope Pocket GRA
(ID-010-06)
Twin Falls County, Idaho



Scale 1:250,000
(Twin Falls 1°x2° NTMS Quadrangle)

FIGURE 2-2

Geologic Map
Antelope Pocket GRA
(ID-010-06)
Twin Falls County, Idaho



Scale 1:250,000
(Twin Falls 1°x2° NTMS Quadrangle)

FIGURE 2-2
(Continued)

Geologic Map Legend For
Antelope Pocket GRA
(ID-010-06)
Twin Falls County, Idaho

Qal - Stream Alluvium

Tb - Banbury Basalt: Olivine basalt altered to basaltic saprolite.

Tiv - Idavada Volcanics: Silicic latite; devitrified welded tuffs and minor interbedded sediments.

━ - Fault (dashed where inferred)

— - Geologic contact (dashed where inferred)

☼ - Volcanic Vent

2.2.1 Geomorphology

The entire Antelope Pocket GRA is characterized by a relatively flat lying basalt plateau into which the Salmon Falls Creek and its tributaries are deeply incised. Perennial tributaries of Salmon Falls Creek include Devil Creek and Cedar Creek. Salmon Falls Creek flows northward through the middle of the GRA. WSA 17-10 encompasses approximately 15 miles of the length of Salmon Falls Creek canyon. The WSA is just over two miles wide at its widest point and includes little more that the canyon proper.

The Salmon Falls Creek canyon is rimmed by precipitous basalt cliffs. The elevation of the rim ranges from about 5,100 feet in the south to 4,000 feet in the north. The depth of the canyon ranges from 300 feet to over 600 feet. The total relief within the GRA is 2,600 feet. The highest point, 6,100 feet, occurs in the southern part of the GRA. The lowest point, 3,500 feet, is in Salmon Falls Creek canyon in the northern part of the GRA.

2.2.2 Lithology and Stratigraphy

The Antelope Pocket GRA is underlain almost entirely by the Tertiary Banbury Basalt (Figure 2-1). The Banbury Basalt consists of layered olivine-bearing basalts and basaltic saprolites with minor interbedded lacustrine sediments. The Banbury Basalt is the oldest formation in the Idaho Group. It unconformably overlies the Idavada Volcanics and has a maximum thickness of about 1,900 feet. Younger units in the Idaho Group are of fluvial and lacustrine origin. These include the Chalk Hills, Glenn's Ferry, and Bruneau Formations; and the Tuana and Black Mesa Gravels(8). The Banbury Basalt covers 95 percent of the study area. Volcanic vent areas occur in the northwest part of the GRA.

The Idavada Volcanics are an extensive sequence of Tertiary volcanic units that contain minor inter-related sedimentary beds. They occur at the surface only in the southern part of the GRA and within the canyon of Salmon Falls Creek. The Idavada Volcanics include silicic latites, tuffs, and devitrified welded ash-flow tuffs. In southwestern Idaho the Idavada Volcanics include the Juniper Mountain tuff and flow complex, the Antelope Ridge tuff and less extensive tuffaceous units.

There is no information available regarding Pre-Tertiary rocks in the Antelope Pocket GRA. The nearest outcrops of Pre-Tertiary rocks are several miles west of the area in

the Owyhee Uplands. The GRA is outside the margins of both the Paleozoic and the Triassic depositional basins. Pre-Devonian rocks may exist at depth, but there is no subsurface information available for this area.

2.2.3 Structural Geology

The structural geology of the Antelope Pocket GRA is obscured by the Snake River Plains-related basalts that formed in response to the downwarping of the Snake River basin. The Snake River basin is a broad graben or depression that extends across southern Idaho into southeastern Oregon. The Antelope Pocket GRA lies on the southern edge of this basin between the Snake River Plains and the Owyhee Uplift.

A relatively small number of faults occur in the area. These faults trend northwesterly and are downthrown on the basin-ward side. Volcanic vents occur in the north and northwest parts of the GRA.

2.2.4 Paleontology

The Idavada Volcanics are the only exposed strata in the Antelope Pocket GRA that may contain paleontological resources. Tertiary fossil assemblages might occur in minor sedimentary sequences within the Idavada Volcanics(9). Information about Paleozoic and Mesozoic sequences is non-existent in this area.

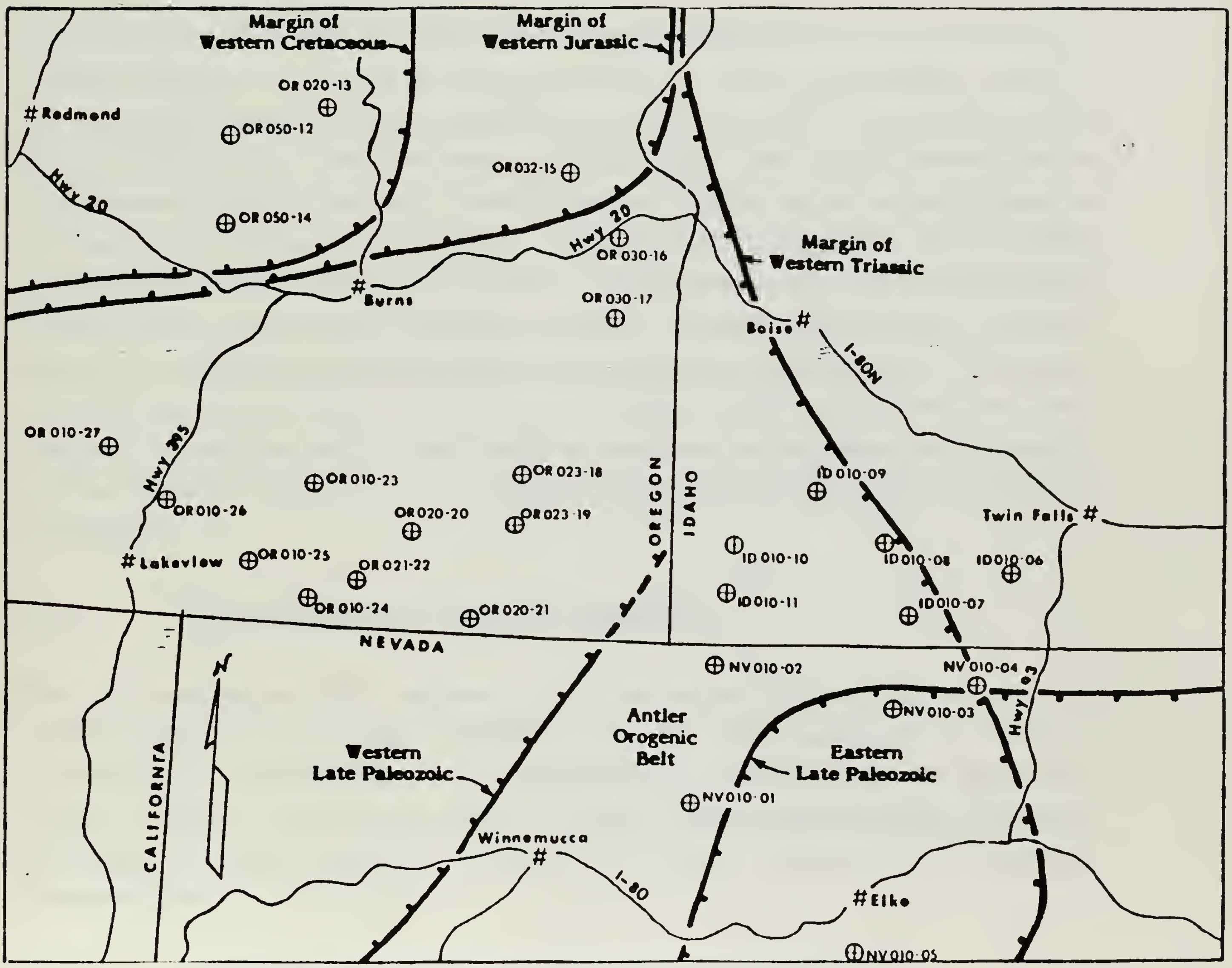
2.2.5 Historical Geology

Little is known of the historical geology of the Antelope Pocket GRA. All Pre-Tertiary information is obscured by the Banbury Basalt. Presumably, the area was a highland from Late Devonian time through Early Tertiary because it is in line with the projection of the Antler Uplands from Nevada and southwestern Idaho. It is not within the margins of Late Paleozoic or Triassic depositional basins in western North America(10).

The Snake River basin developed during the Cenozoic. Estimates of the total thickness of Cenozoic units within the basin that have been downdropped against the Idaho Batholith range up to 38,000 feet. The Idaho Group, including the Banbury Basalt, Chalk Hills Formation, Glenn's Ferry Formation, Tuana Gravel, Bruneau Formation, and Black Mesa Gravel, ranges in age from Middle Pliocene through Middle Pleistocene. The Banbury Basalt unconformably overlies the Idavada Volcanics. Peroids of block faulting and erosion followed deposition of the Idaho Group(11).

FIGURE 2-3

Paleogeographic Map[10]
Oregon-Idaho-Nevada
Tri-State Area



2.3 ENVIRONMENTS FAVORABLE FOR GEM RESOURCES

The Antelope Pocket GRA has a low favorability for the occurrence of diatomite. It is not favorable for the occurrence of any other GEM resources.

2.3.1 Environments for Metals Resources

The Antelope Pocket GRA contains no environments favorable for the accumulation of metallic resources. The area is entirely underlain by Tertiary volcanogenic rocks(12). Occurrences of metallic mineralization are not known in the area. There are some parts of the GRA, however, that demonstrate characteristics that may be favorable for the accumulations of metals deposits. One recognition criterion for environments favorable for metals is the presence of evidence of structural site preparation. As seen on the geologic map of the area (Figure 2-2), there are areas of relatively close-spaced faulting. These faulted areas provide the requisite conduits for mineralizing solutions. There is no indication on the surface, however, that a mineralizing process has occurred. The nature of the Paleozoic surface also is not known in the GRA. There could be major structural features on the older surface that would be condusive to the formation of deposits. Tertiary volcanics in the GRA that are up to thousands of feet thick completely mask the older units.

2.3.2 Environments for Oil and Gas Resources

The Antelope Pocket GRA contains none of the requisite geologic criteria for the identification of environments favorable for the accumulation of oil and gas resources(10). It is outside the limits of Late Paleozoic and Triassic marine depositional basins. Although it is within the limits of Lake Bruneau sedimentation, the Bruneau Formation has been removed by erosion. The Idavada Volcanics are not favorable petroleum hosts.

2.3.3 Environments for Oil Shale and Tar Sands Resources

The Antelope Pocket GRA contains no environments favorable for the occurrence of oil shale or oil impregnated sands(13). The area is underlain predominantly by Tertiary volcanics of felsic to ferromagnesian composition. Potential host rocks are largely tuffaceous and contain only minor amounts of non-volcanic clastic material. Favorable lithologies are not present.

2.3.4 Environments for Geothermal Resources

The Antelope Pocket GRA contains no environments favorable for geothermal resources. None of the criteria occur within the area that would indicate the presence of a favorable environment(14). There are no known major Basin and Range faults; there are no known geothermal occurrences associated with Tertiary volcanism.

2.3.5 Environments for Uranium and Thorium Resources

The Antelope Pocket GRA does not contain any environments that are favorable for the occurrence of uranium or thorium deposits(15). The GRA does not exhibit any of the lithological, alteration, or geochemical criteria that would suggest the presence of uranium or thorium. Volcanogenic environments, such as McDermitt caldera and Virgin Valley, are not present in the study area.

2.3.6 Environments for Coal Resources

The Antelope Pocket GRA contains no environments favorable for the occurrence of coal and lignite deposits(16). The chances for coal or carbonaceous materials to have formed in the study area are remote. The geologic development of the GRA does not support the conclusion that euxinic environments favorable for the formation of coal deposits existed in the area. Much of the area either is mantled with accumulations of lavas and related volcanic products or has been modified by adjacent volcanic activity.

2.3.7 Environments for Industrial Minerals Resources

The Antelope Pocket GRA has a low favorability for diatomite resources. Potential diatomite resources could occur in lacustrine sequences within the Tertiary Banbury Basalt or Idavada Volcanics(17).

2.3.8 Environments for Paleontological Resources

The Antelope Pocket GRA contains no environments that are potentially favorable for the occurrence of fossiliferous strata because the majority of the Antelope Pocket GRA is underlain by basalts or other non-fossiliferous lithologies. No fossil localities or other direct or inferred evidence exist in the study area that indicates favorability(9).

2.3.9 Environments for Geologic Hazards

Potential geologic hazards in the Antelope Pocket GRA consist of faults, landslides, and volcanic centers(17). These features were noted from aerial photographs, geologic maps, and topographic maps. There is no historical record of violent seismic or volcanic activity in the area. The potential for mass movement exists along all over-steepened slopes within the GRA.

2.3.10 Educational and Scientific Localities

There are no known ESLs in the Antelope Pocket GRA.

3. ENERGY AND MINERAL RESOURCES IN THE ANTELOPE POCKET GRA

The Antelope Pocket GRA has only low favorability for diatomite resources. The area is not favorable for any other GEM resources.

3.1 KNOWN DEPOSITS

The Antelope Pocket GRA has no known deposits of GEM resources.

3.2 OCCURRENCES

The Antelope Pocket GRA contains several MILS occurrences (Figure 3-1) that are related to gravel operations in Quaternary alluvium. These gravel pits are well outside the WSA. There are no CRIB or NURE occurrences or localities within the GRA.

3.3 CLAIMS

The Antelope Pocket GRA contains one claim west of the WSA (Figure 3-2). Claims information is current as of 15 August, 1982.

3.4 LEASES

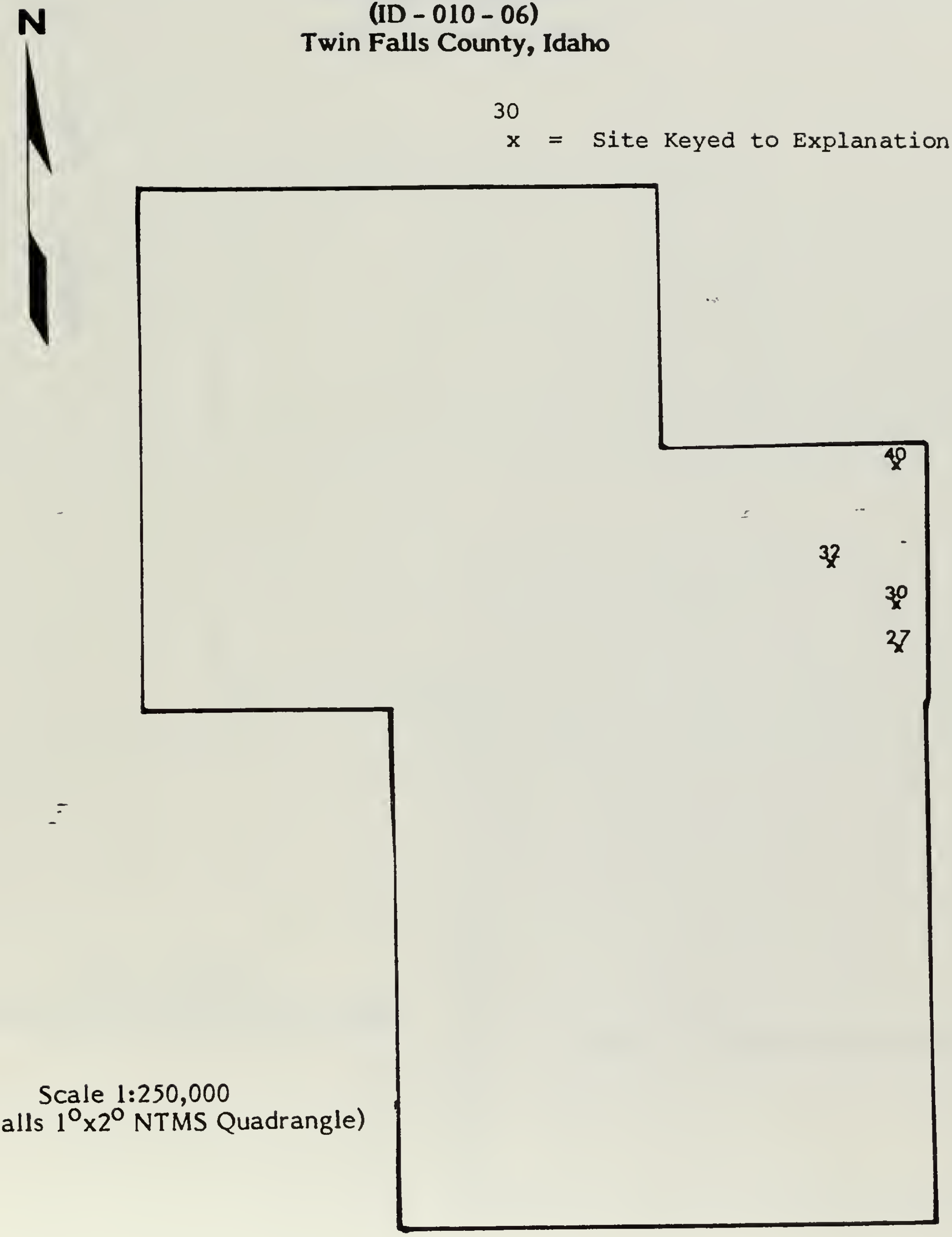
Approximately 50 percent of the Antelope Pocket GRA and 65 percent of the contained WSA are currently leased or are under lease application for oil and gas. Lease information is current as of 15 August, 1982.

3.5 DEPOSIT TYPES

There are no known deposits within the Antelope Pocket GRA; none are anticipated.

FIGURE 3-1

MILS Localities Map
Antelope Pocket GRA
(ID - 010 - 06)
Twin Falls County, Idaho

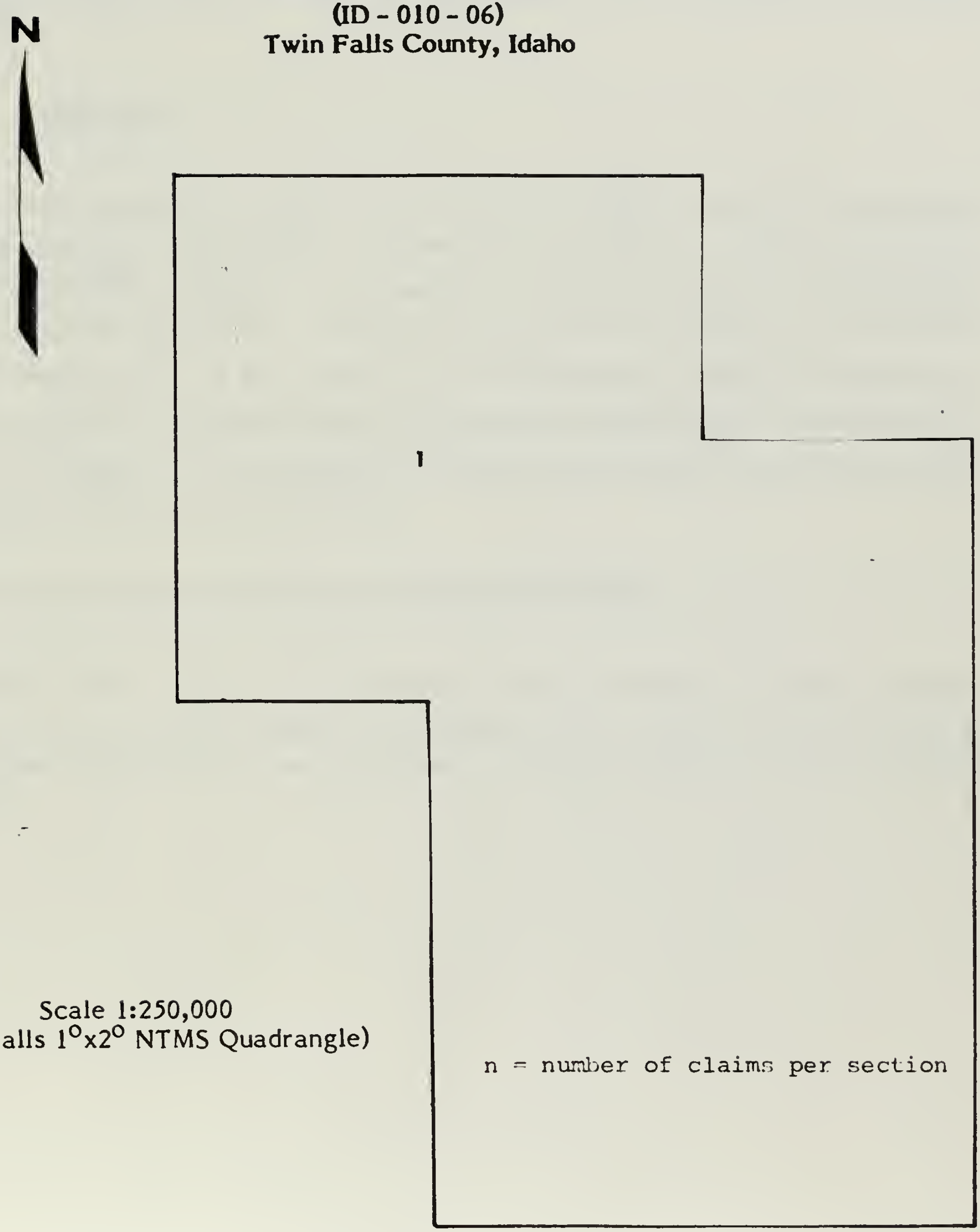


Scale 1:250,000
(Twin Falls 1°x2° NTMS Quadrangle)

This map is an overlay for Figures 2-1 and 2-2.

FIGURE 3-2

Claims Density Map
Antelope Pocket GRA
(ID - 010 - 06)
Twin Falls County, Idaho



Scale 1:250,000
(Twin Falls 1°x2° NTMS Quadrangle)

This map is an overlay for Figures 2-1 and 2-2.

3.6 MINERAL ECONOMICS

The Antelope Pocket GRA has a low favorability for the occurrence of diatomite resources.

3.6.1 Diatomite

Diatomite is used primarily as a filter-aid, as an industrial filler, and other miscellaneous applications, including insulation(18). Diatomite was produced by seven companies in four states in 1981(19). California accounted for more than 50 percent of total diatomite production. The United States is the largest world producer and consumer of diatomite. The United States also is a net exporter of this commodity. Demand for diatomite is expected to increase at an annual rate of three percent through 1990. World resources of diatomite are adequate for the foreseeable future, but the need for near-market sources will encourage development of new sources.

3.7 STRATEGIC AND CRITICAL MINERALS AND METALS

The Antelope Pocket GRA is not favorable for any strategic or critical metals or minerals as listed in the BLM-supplied compilation given in Table 3-4 of TERRADATA's report entitled "Procedures for the Assessment of Geology, Energy, and Minerals (GEM) Resources."

4. CLASSIFICATION OF LAND FOR GEM RESOURCES POTENTIAL

The precise location of specific favorable environments within a given GRA depends upon three principal factors:

- The precision and specificity of available data;
- The nature (size and spatial distribution) of anticipated deposits as predicted from known models; and
- The geometry of the favorable geologic environments.

Information in the Antelope Pocket GRA is limited and very general. Sub-surface information is virtually non-existent. Therefore, the entire area, rather than specific subareas, has been classified for individual GEM resources. (see Figure 4-1 and Table 4-1).

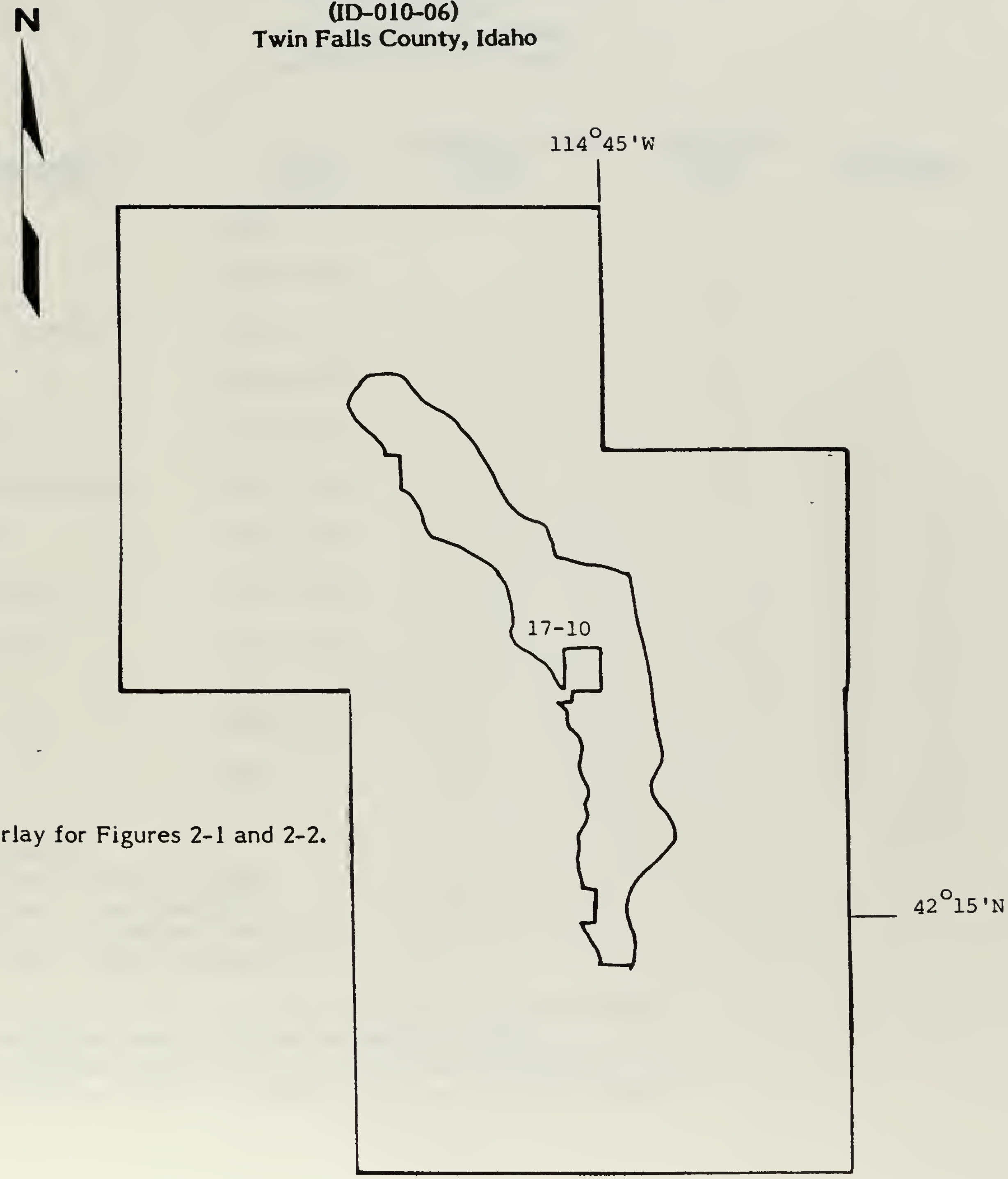
The entire Antelope Pocket GRA has a low favorbility (Class 2B) for potential diatomite resources. This classification signifies that the area exhibits minimal direct evidence of a favorable geologic environment that supports the probable occurrence of this resource.

The Antelope Pocket GRA exhibits no favorable characteristics (Class 1) for any other GEM resources because requisite geologic environments and geologic processes cannot be demonstrated to occur in the study area.

TERRADATA's classification of the Antelope Pocket GRA for leasable GEM resources is in agreement with the USGS classification of the same area, with the exception of potential oil and gas resources(21, 22). The USGS includes this GRA in a large area of southern Idaho that is considered potentially favorable for oil and gas(20). TERRADATA believes that geologic environments favorable for the accumulation of oil and gas do not exist in this area. Potentially favorable Late Paleozoic and Triassic basin deposits are not present in this part of Idaho.

FIGURE 4-1

Land Classification Map
Antelope Pocket GRA
(ID-010-06)
Twin Falls County, Idaho



his map is an overlay for Figures 2-1 and 2-2.

Scale 1:250,000
(Twin Falls 1°x2° NTMS Quadrangle)

TABLE 4-1

Classification Of Lands Within The Antelope Pocket GRA (ID - 010 - 06) Twin Falls County, Idaho For GEM Resource Potential

COMMODITY	AREA	CLASSIFICATION LEVEL	CONFIDENCE LEVEL	REMARKS
Metals	Entire GRA	1	B	
Geothermal	Entire GRA	1	B	
Uranium/Thorium	Entire GRA	1	A	
Coal	Entire GRA	1	C	
Oil and Gas	Entire GRA	1	B	
Tar Sands/Oil Shale	Entire GRA	1	C	
Diatomite	Entire GRA	2	B	
Other Minerals	Entire GRA	1	A	
Paleontology	Entire GRA	1	A	
Hazards	See Hazards Map (GRA File)			
ESLs	None	1	C	

LEGEND:
Class 1 - Least Favorable
Class 2 - Low Favorability
Class 3 - Moderate Favorability
Class 4 - High Favorability

Confidence Level A - Insufficient data or no direct evidence
Confidence Level B - Indirect evidence available
Confidence Level C - Direct evidence but quantitatively minimal
Confidence Level D - Abundant direct and indirect evidence

5. RECOMMENDATIONS FOR FUTURE WORK

Further surface geologic investigations, including detailed mapping and stratigraphic studies, could enhance the confidence levels of many of the classifications in the Antelope Pocket GRA. It is doubtful, however, that the original classifications would change substantially. Sub-surface investigations are probably not warranted in this area due to the costly nature of the available methods. Geophysical and geochemical surveys might provide some insight into the potential resources in the study area.

- APPENDIX A -

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- APPENDIX B -

Explanation for Figure 3-1

FIGURE 3-1

(Explanation)

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    37
27  NAME- GRAVEL PIT                                  REFERENCE NUMBER- 0160830053
    STATE- IDAHO                          COUNTY- TWIN FALLS                     ELEV:PREC- 1381M:500M
    LATITUDE-   N 42 20 48               PRECISION-  100M
    LONGITUDE- W 114 38 52  REFERENCE POINT- TRENCH
    UTM:  ZONE 11N  NORTHING 4690732  EASTING 693705
    PUBLIC LAND SURVEY  TOWNSHIP- 012 S   RANGE- 015 E
        DESCRIPTION      SECTION- 25  SECTION SUBDIVISION- SESWSW
    RIVER BASIN- 79U   SNAKE RIVER                         DOMAIN- UNKNOWN
    STATUS- PAST PRODUCER  OPERATION TYPE- SURFACE
    MESA ID NO.              YEAR FIELD CHECKED-        MAP REPOSITORY-  FOC
    MAP NAME- DRIGGS                 TYPE- 15 MIN
    1:250.000 MAP NAME- TWIN FALLS                MINERAL PROPERTY FILE-
    PRIMARY NAME- GRAVEL PIT
    COMMOD/MOD-  SAND & GRAVEL
    USGS TOPO MAP LOCATION

    38
27  NAME- GRAVEL PIT                                  REFERENCE NUMBER- 0160830054
    STATE- IDAHO                          COUNTY- TWIN FALLS                     ELEV:PREC- 1331M:500M
    LATITUDE-   N 42 20 45               PRECISION-  100M
    LONGITUDE- W 114 38 50  REFERENCE POINT- TRENCH
    UTM:  ZONE 11N  NORTHING 4690641  EASTING 693803
    PUBLIC LAND SURVEY  TOWNSHIP- 012 S   RANGE- 015 E
        DESCRIPTION      SECTION- 36  SECTION SUBDIVISION- NENENW
    RIVER BASIN- 79U   SNAKE RIVER                         DOMAIN- UNKNOWN
    STATUS- PAST PRODUCER  OPERATION TYPE- SURFACE
    MESA ID NO.              YEAR FIELD CHECKED-        MAP REPOSITORY-  FOC
    MAP NAME- HOLLISTER SW           TYPE- 7.5 MIN
    1:250.000 MAP NAME- TWIN FALLS                MINERAL PROPERTY FILE-
    PRIMARY NAME- GRAVEL PIT
    COMMOD/MOD-  SAND & GRAVEL
    USGS TOPO MAP LOCATION

   43
30 NAME- GRAVEL PIT                                  REFERENCE NUMBER- 0160330052
   STATE- IDAHO                          COUNTY- TWIN FALLS                     ELEV:PREC- 1331M:500M
   LATITUDE-   N 42 21 42               PRECISION-  100M
   LONGITUDE- W 114 38 54  REFERENCE POINT- TRENCH
   UTM:  ZONE 11N  NORTHING 4692396  EASTING 693663
   PUBLIC LAND SURVEY  TOWNSHIP- 012 S   RANGE- 015 E
       DESCRIPTION      SECTION- 24  SECTION SUBDIVISION- SWSW
   RIVER BASIN- 79U   SNAKE RIVER                         DOMAIN- COUNTY
   STATUS- PAST PRODUCER  OPERATION TYPE- SURFACE
   MESA ID NO.              YEAR FIELD CHECKED-        MAP REPOSITORY-  FOC
   MAP NAME- HOLLISTER SW           TYPE- 7.5 MIN
   1:250.000 MAP NAME- TWIN FALLS                MINERAL PROPERTY FILE-
   PRIMARY NAME- GRAVEL PIT
   COMMOD/MOD-  SAND & GRAVEL
   NORBURG JOHN 1971 USBM UPPER SNAKELAND USE PERSONAL FILE
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FIGURE 3-1

(Explanation Concluded)

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    45
 32 NAME- GRAVEL PIT                              REFERENCE NUMBER- 0160830082
    STATE- IDAHO                     COUNTY- TWIN FALLS                  ELEV:PREC- 0518M:50CM
    LATITUDE-    N 42 22 32         PRECISION-   100M
    LONGITUDE- W 114 40 39  REFERENCE POINT- TRENCH
    UTM:   ZONE 11N  NORTHING 4693873  EASTING 691219
    PUBLIC LAND SURVEY  TOWNSHIP- 012 S    RANGE- 015 E
        DESCRIPTION      SECTION- 15  SECTION SUBDIVISION- S2S2SE
    RIVER BASIN- 79U   SNAKE RIVER                      DOMAIN- UNKNOWN
    STATUS- PAST PRODUCER  OPERATION TYPE- SURFACE
    MESA ID NO.               YEAR FIELD CHECKED-      MAP REPOSITORY-  FOC
    MAP NAME- BERGER BUTTE         TYPE- 7.5 MIN
    1:250.000 MAP NAME- TWIN FALLS              MINERAL PROPERTY FILE-
    PRIMARY NAME- GRAVEL PIT
    COMMOD/MOD-  SAND & GRAVEL
    USGS TOPO MAP LOCATION

    56
 40 NAME- GRAVEL PIT                              REFERENCE NUMBER- 0160830075
    STATE- IDAHO                     COUNTY- TWIN FALLS                  ELEV:PREC- 1381M:50CM
    LATITUDE-    N 42 24 28         PRECISION-   500M
    LONGITUDE- W 114 38 49  REFERENCE POINT- TRENCH
    UTM:   ZONE 11N  NORTHING 4697520  EASTING 693036
    PUBLIC LAND SURVEY  TOWNSHIP- 012 S    RANGE- 015 E
        DESCRIPTION      SECTION- 01  SECTION SUBDIVISION- C SW
    RIVER BASIN- 79U   SNAKE RIVER                      DOMAIN- COUNTY
    STATUS- PAST PRODUCER  OPERATION TYPE- SURFACE
    MESA ID NO.               YEAR FIELD CHECKED-      MAP REPOSITORY-  FOC
    MAP NAME- BERGER BUTTE         TYPE- 7.5 MIN
    1:250.000 MAP NAME- TWIN FALLS              MINERAL PROPERTY FILE-
    PRIMARY NAME- GRAVEL PIT
    COMMOD/MOD-  SAND & GRAVEL
    NORBURG JOHN 1971 USBM UPPER SNAKELAND USE PERSONAL FILE
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